

DOCUMENT RESUME

ED 231 842

TM 830 291

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TITLE Conducting Statewide LEA Title I Sustained Effects Studies.
PUB DATE Apr 83
NOTE 53p.; Paper presented at the Annual Meeting of the American Educational Research Association (67th, Montreal, Quebec, April 11-15, 1983); Some tables may be marginally legible due to small print.
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142)
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Achievement Gains; *Compensatory Education; Data Collection; Educational Legislation; Elementary Education; *Evaluation Methods; Guides; *Models; *School Districts; State Departments of Education; State Programs; State School District Relationship
IDENTIFIERS Education Consolidation Improvement Act Chapter 1; Elementary Secondary Education Act Title I; *Sustaining Effects Study

ABSTRACT

Like the Elementary Secondary Education Act Title I, the Education Consolidation Improvement Act Chapter 1 requires school districts to determine at least once every 3 years whether Title I achievement gains are sustained over a period of 12 months or more. A local education agency (LEA) has considerable flexibility in the approach it takes in such a study. Among some options are whether to use data only on Title I, or to include former Title I or non-Title I students; focus on one or multiple grade levels; and focus on one or multiple subject areas. The Pennsylvania Sustained Effects Evaluation Model and handbook were developed for the Pennsylvania Department of Education by the Regional Technical Assistance Center to allow LEAs to use existing Title I evaluation data. Pretest and posttest standardized achievement data were used. The model was used to determine whether students who completed the third grade Title I reading program in 1979-80 sustained their achievement gains as fourth graders. Analysis of the data generated by this study supports Title I program effectiveness. Not only were positive annual results obtained, but they were sustained over at least 2 years of program participation. This study also demonstrated that a statewide model for conducting sustained effects evaluations can be successfully implemented. (Author/CM)

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CONDUCTING STATEWIDE LEA TITLE I
SUSTAINED EFFECTS STUDIES

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Paper presented at the Annual Meetings of the American Educational
Research Association, Montreal, Canada, April, 1983.

Printed in U.S.A.

ED231842

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Conducting Statewide LEA Title I Sustained Effects Studies

Introduction

One of the few aspects of ESEA Title I that virtually has been unchanged by the new ECIA Chapter 1 legislation is the requirement to evaluate the sustained effects of Chapter 1 projects on children. Both the new and old laws require school districts to determine at least once every three years whether or not Title I achievement gains are sustained over a period of 12 months or longer [P.L. 95-561, Section 124(g)(2) and P.L. 97-35, Section 556(b)(41)].

The specific formal requirements associated with implementing this Title I provision have been minimal. Title I regulations required that:

- At least once in each three year cycle an additional objective measure of educational performance be administered to students who were in the Title I project to determine whether achievement gains are sustained;
- The measure of sustained effects must be administered at least twelve months later than the pretest administered for the project evaluation;
- The LEA must use the results for planning and to improve the project in the future; and
- Data resulting from the measurement of sustained effects should be kept available for inspection for a period of five years from the date of the measurement or until any pending Federal audit is resolved.

Within these conditions, an LEA has considerable flexibility concerning the specific approach it will take in conducting its sustained effects study.

Options open for district decision-making include the following:

- Whether to collect and analyze data on only Title I children or to include former Title I students or non-Title I students in the study as well.
- Whether to focus on only one grade level of children receiving Title I or to include multiple grade levels in the study.
- Whether to focus on only one Title I subject area (such as reading) or to study multiple subject areas.

- Whether to collect and analyze data on all students in the targeted grade(s) and subject area(s) or to select a representative sample of such students for study.
- Whether to utilize data already being collected to meet the short-term Title I evaluation requirements or to select a different data base.

Methodology

Ideally, choice of an approach for conducting a sustained effects evaluation should be based on the most critical information needs within a district coupled with the level of administrative resources available for conducting the study. With the requirement that LEAs complete a sustained effects evaluation for the first three-year evaluation cycle, the Division of Compensatory Programs of the Pennsylvania Department of Education (PDE) approached the Regional Technical Assistance Center (TAC) in February of 1982. PDE needed assistance to develop a sustained effects evaluation model that could be employed easily and quickly by LEAs. Within six weeks, the TAC developed the Pennsylvania Sustained Effects Evaluation Model evaluation handbook entitled Conducting a Title I Sustained Effects Study in Pennsylvania. Recognizing the similarity of most Title I programs in the state and the administrative constraints of both time and resources facing many LEAs, the TAC-developed model allowed LEAs to conduct a sustained effects evaluation using existing Title I evaluation data.

Each year the 500 LEAs in Pennsylvania with Title I programs submit pretest and posttest standardized achievement data to the Commonwealth in fulfillment of their Title I evaluation reporting requirement. The SEA validates the LEA raw score-to-percentile score conversions process and generates classroom, building and district level summary reports. These previously submitted data, on file in each LEA, provided the data for the sustained effects evaluations within each LEA.

The PA Sustained Effects Evaluation Model was designed to answer the following sustained effects question within each LEA:

On the average, did students who completed our third grade Title I reading program in 1979-80 sustain their achievement gains when participating in Title I the next year as fourth graders?

The model makes only two assumptions. First, it assumes that data for 1979-80 third grade and 1980-81 fourth grade reading projects were readily available. Other adjacent grade levels, subject matter areas and/or the 1980-81/1981-82 school years could have been employed in the model. This combination was selected for illustration because the data were already in hand in most LEAs, and there were more Pennsylvania Title I services delivered to third and fourth graders in reading than in any other grade/subject matter. The second assumption is that a fall/spring evaluation testing cycle was used; thus, a fall/spring/spring evaluation design can be employed. Fewer than 35 of the 500 LEAs with Title I programs do not use a fall/spring testing cycle. In actuality, many other grade levels, subject matter areas, and annual testing cycles (fall/fall/fall or spring/spring/spring) were investigated by LEAs to meet the requirement.

The evaluation handbook, entitled Conducting a Title I Sustained Effects Study in Pennsylvania, consists of an overview and three sections. The first section presents step-by-step data recording and tabulating procedures for implementing the Pennsylvania Sustained Effects Evaluation Model. An eleven step process is specified that includes sampling procedures, matching student scores, converting percentile scores to NCEs¹, and tabulating and summarizing results. The second section describes a procedure for graphing study results

¹NCEs (Normal Curve Equivalents) are a type of standard score which range from 1 to 99 with a midpoint (mean) of 50 so as to be similar to the non-equal interval percentiles. They have a standard deviation of 21.06 and can be derived from percentiles by means of a table look-up or a mathematical algorithm.

and presents in-depth discussions of possible interpretations for each type of graphed result. The last section presents three alternative sustained effects study designs based on three distinct evaluation questions. The Appendix contains sample recording and reporting forms, summary data sheets, and sustained effects plotting graphs on perforated, tear-out sheets. Figure 1 presents a handbook "Locator Form" that highlights the main content area covered in the workbook's three sections.

Preliminary Results

The PA Sustained Effects Evaluation Model was presented by the Technical Assistance Center in a statewide series of 15 workshops. Over 700 LEA personnel attended these workshops and had an opportunity to apply the model during individually-scheduled consultations. During these consultations, many LEAs were able to complete the study requirements.

An analysis of these initially completed studies revealed several interesting findings. Forty-five sustained effects evaluations were completed during consultations with 40 LEAs. The PA Model considers only those students who are in the Title I program for two consecutive years. Since the successful students "graduate" from the program, it was anticipated that continued students would show small, if any, NCE gains. However, in almost three-fourths of the studies, these continued students demonstrated NCE gains (defined as at least 3 NCEs) from the pretest-to-posttest evaluation. Less than five percent showed a loss during the pretest-to-posttest period.

The real focus of sustained effects evaluation is the third data point--the sustained effects measure. If Title I is successful, gains should be sustained over multiple years of program exposure. In other words, there should be few, if any, summer losses and continual student progress. Over

Section #	1	2	3
Section Title	Step-By-Step Procedures for Conducting Your Sustained Effects Study	Graphing and Interpreting Your Sustained Effects Study Findings	Alternative Approaches
Main Theme	<i>Describes in detail one type of sustained effects study design</i>	<i>Describes how to graph study findings and suggests interpretations for different findings</i>	<i>Outlines alternative sustained effects study designs based on three distinct evaluation questions</i>
	Steps: 1. List the ID number and percentile scores of all third grade reading students who have both a pretest and posttest score for 1979-80 2. Count the number of students having both a pretest and posttest score 3. If there are more than 150 third grade students, decide if you want to sample students 3a. Sample students by crossing off excluded students 4. Record spring 1980-81 percentile scores for sampled students 5. Eliminate students without a sustained effects measure 6. Count and record the number of students with complete sustained effects evaluation data 7. Obtain pretest, posttest, and sustained effects measure NCE scores for these students 8. Sum the pretest, posttest, and sustained effects scores on each worksheet 9. Transfer worksheet sums to summary sheet 10. Total summary sheet data 11. Obtain and record pretest, posttest, and sustained effects average (mean) scores	Interpretation of Sustained Effects Patterns: 1. Patterns with short-term achievement gains • continuous gains • sustained but not enhanced gains • non-sustained gains 2. Patterns without short-term achievement gains • long-term achievement gains (or stability) • long-term achievement losses	Questions: 1. What happens to students over the school year following their participation in Title I? 2. What happens to student achievement over the summer months? 3. Does the student/instructor ratio affect the maintenance of Title I gains?

Figure 1. Handbook Locator Form

40 percent of these initial evaluations did demonstrate sustained effects of Title I services. Less than 25 percent of the evaluations demonstrated short or long-term losses. The remaining 35 percent were unable to demonstrate continued (sustained) Title I achievement gains.

Based on these preliminary results, PDE and the TAC decided to conduct a follow-up study of sustained effects evaluations in Pennsylvania. A letter was sent to the Chapter 1 Coordinator in each of the 500 LEAs in Pennsylvania asking them to voluntarily complete a Sustained Effects Study Summary Sheet (sample copy in Appendix A). To date, over 350 LEAs have responded, with many LEAs submitting results for multiple evaluation questions, grade levels, and/or subjects.

Table I summarizes voluntary submissions of sustained effects study results. Since the PA Sustained Effects Model examined the effects from two consecutive years of Title I participation (Evaluation Question #1), most of the submitted studies also examined Evaluation Question #1. Of the 702 usable studies submitted, 86 percent used the PA Sustained Effects Model. Since there are many more reading programs than mathematics programs (and perhaps because the Model illustrated reading), over 72 percent of the studies examined effects of continued reading services. Only seven percent of the studies looked at sustained effects one year after students exited from the program (Evaluation Question #2). Less than six percent of the studies examined sustaining effects over a summer period (Evaluation Question #3).

Because most of the submitted studies looked at sustained effects for reading students who continued in Title I over a two year period, this paper will concentrate on those results. Most of these studies (over 43 percent) used the illustrative evaluation question--looking at third grade reading students who continued in the program as fourth graders. However, another

Table 1. Sustained Effects Studies by
Type of Study

<u>Evaluation Question</u>	<u>Subject Matter</u>	<u>Grade Level*</u>	<u>Number of Studies</u>
1. Sustained Effects from two consecutive years of Title I services	Reading	Multiple	12
		1	10
		2	75
		3	221
		4	62
		5	52
		6	28
		7	22
		8	10
		9	5
		10	6
		11	4
	Mathematics	Multiple	4
		1	0
		2	11
		3	28
		4	21
		5	18
		6	8
		7	6
		8	1
		9	0
		10	1
		11	0
2. Sustained Effects one year after exiting from the Title I program	Reading	Multiple	4
		2	6
		3	14
		4	8
		5	4
		6	1
		7	1
	Mathematics	Multiple	2
		2	3
		3	3
		4	3
		5	1
3. Sustained Effects over the summer following participation in the Title I program	Reading	Multiple	1
		1	1
		2	5
		3	15
		4	4
		5	5
		6	1
		7	1
		8	3
		10	1
	Mathematics	Combined	4
4. Sustained Effects from three consecutive years of Title I services	Reading	Combined	6

*"Multiple" grade levels means that because of small numbers of students, these projects collapsed data over multiple grade levels. "Combined" grade levels means there were too few studies conducted to separate by grade level of the purposes of this table.

47 percent examined grades 2, 4, 5, 6, or 7. Projects submitting studies covering multiple grade levels are not included in the analyses because of problems in interpreting grade level differences.

Implementing a sustained effects study requires three testing points: a pretest, a posttest, and a sustained effects measure. Less than seven percent of the submitted studies used annual testing cycles (fall/fall/fall, spring/spring/spring, or midyear/midyear/midyear) to conduct their sustained effects studies. For ease of analysis, the submitted studies with annual pretest/posttest cycles were included with fall/spring test cycles. In all instances, the sustained effects measure occurred twelve months after the posttest.

In 45 of the reading studies for Evaluation Question #1 (about nine percent), a different test was used for the sustained effects measure than for the pretest/posttest measures. Two studies used three different measures. However, since percentiles (and hence NCEs) should have the same meaning from one test to another, all studies were examined together. Over 50 percent (250) of these reading studies used the Gates-MacGinitie Reading Achievement Test for at least one measurement point. The remaining studies used 14 different tests. Although this paper will not examine sustained effects by test or testing cycle, subsequent analyses will be conducted to determine the effects, if any, of these factors.

The results for reading achievement sustained effects studies in grades 1 through 11 using Evaluation Question # 1 are presented in Table II. Results are similar for both the average district means and for the weighted means. The number of students per district study ranged from 1 to 262, with an average of 18.2 students per district. Since the authors feel the correct unit of analysis for this study is the district (Title I project) and not the

Table II
Sustained Effects Study Mean NCE Results by Grade Level
for Reading Projects Using the PA Sustained Effects Evaluation Model

Grade Level	Number of Districts	District Means					Number of Students	Weighted Means*				
		Pretest	Posttest	Pre/Post Gain	SE Measure	Post/SE Gain		Pretest	Posttest	Pre/Post Gain	SE Measure	Post/SE Gain
1	10	28.7	39.7	11.0	41.9	2.2	196	27.5	37.7	10.2	41.0	3.3
2	75	31.2	38.7	7.5	41.5	2.8	1366	31.4	38.8	7.4	40.8	2.0
3	221	30.0	36.9	6.9	38.5	1.6	4684	30.2	37.1	6.9	37.9	0.8
4	62	28.6	34.4	5.8	37.5	3.1	937	29.0	35.2	6.2	37.7	2.5
5	52	28.1	34.8	6.7	37.4	2.6	900	28.1	34.2	6.1	37.0	2.8
6	28	29.3	34.2	4.9	35.9	1.7	370	29.4	34.9	5.5	36.5	1.6
7	22	28.3	31.6	3.3	33.4	1.8	330	26.4	31.0	4.6	32.6	1.6
8	10	28.4	32.2	3.8	34.1	1.9	93	29.9	30.7	0.8	36.5	5.8
9	5	26.8	31.6	4.8	32.1	0.5	48	27.8	34.9	7.1	34.7	(0.2)
10	6	35.2	36.9	1.7	35.1	(1.8)	39	30.2	32.1	1.9	31.5	(0.6)
11	4	22.4	27.8	5.4	25.6	(2.2)	39	27.5	30.9	3.4	33.0	2.1

*Weighted means were obtained by multiplying the number of students in each district by the district mean, summing across districts, and then dividing the total by the total number of students.

student, only the district means are discussed below. The weighted means are given simply for reference. The number of districts is very small (< 30) for all grades except grades 2 through 5, and especially so for grades 1 and 8 through 11. Therefore, trends will be examined primarily for grades 2 through 7.

NCE gains from pretest to posttest are inversely related to grade level. Similar results did not occur for the measure of sustained effects from posttest to a point twelve months later. Here the NCE gains tend to be much smaller and to range between 1.6 and 3.1 NCEs. These annual gains are also much smaller than general fall-to-spring pretest-to-posttest results.

Another way of examining these gains is to look at the pattern of gains between the pretest and posttest, and the posttest and sustained effects measure. These results are displayed in Table III. A gain is positive (negative) if the district mean NCE increased (decreased) by more than 1.0 NCE between the two adjacent testing points. Otherwise, the gain was considered non-stable, and the two scores were considered to be the same.

Using the above criteria, over 80 percent of the district studies demonstrated positive gains between pretest and posttest, and about 11 percent demonstrated negative gains. However, less than 60 percent of the districts exhibited positive gains between the posttest and the sustained effects measure, while over 25 percent showed negative "gains."

Table IV presents patterns of district results across the pretest/posttest period and the posttest/sustained effects measurement period. Most projects (over 44 percent) exhibited positive gains at both time points, with less than 25 percent showing a loss after an initial gain. About 9 percent demonstrated a positive gain after an initial loss, while almost 13 percent showed no sustained gain after an initial project gain.

Table III

Patterns of Sustained Effects Study Results Between Adjacent Testing Points
by Grade Level for Reading Projects Using the PA Sustained Effects Evaluation Model*

Grade Level	Pretest/Posttest						Posttest/SE Measure					
	Same		Positive		Negative		Same		Positive		Negative	
	<u>N</u>	(%)	<u>N</u>	(%)	<u>N</u>	(%)	<u>N</u>	(%)	<u>N</u>	(%)	<u>N</u>	(%)
1	0	(0.0)	10	(100.0)	0	(0.0)	1	(10.0)	8	(80.0)	1	(10.0)
2	10	(13.3)	59	(78.7)	6	(8.0)	7	(9.3)	51	(68.0)	17	(22.7)
3	17	(7.7)	180	(81.4)	24	(10.9)	39	(17.6)	120	(54.3)	62	(28.1)
4	0	(0.0)	53	(85.5)	9	(14.5)	7	(11.3)	40	(64.5)	15	(24.2)
5	3	(5.8)	45	(86.5)	4	(7.7)	7	(13.5)	34	(65.4)	11	(21.2)
6	5	(17.8)	19	(67.9)	4	(14.3)	4	(14.3)	15	(53.6)	9	(32.1)
7	3	(13.6)	15	(68.2)	4	(18.2)	5	(22.7)	11	(50.0)	6	(27.3)
8	1	(10.0)	6	(60.0)	3	(10.0)	1	(10.0)	6	(60.0)	3	(30.0)
9	0	(0.0)	4	(80.0)	1	(20.0)	0	(0.0)	3	(60.0)	2	(40.0)
10	1	(16.7)	4	(66.7)	1	(16.7)	2	(33.3)	1	(16.7)	3	(33.3)
11	1	(25.0)	3	(75.0)	0	(0.0)	1	(25.0)	1	(25.0)	2	(50.0)

*A pattern is considered positive (negative) if the district mean NCE increases (decreases) by more than 1.0 NCE between two testing points. Otherwise it is considered to be the "same."

Table IV

Patterns of Sustained Effects Study Results Across Adjacent Testing Points
by Grade Level for Reading Projects Using the PA Sustained Effects Evaluation Model*

Grade Level	Same/Same**		Same/Positive		Same/Negative		Positive/Same		Positive/Positive		Positive/Negative		Negative/Same		Negative/Positive		Negative/Negative	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
1	0	(0.0)	0	(0.0)	0	(0.0)	1	(10.0)	8	(80.0)	1	(10.0)	0	(0.0)	0	(0.0)	0	(0.0)
2	3	(4.0)	6	(8.0)	1	(1.3)	4	(5.3)	40	(53.3)	15	(20.0)	0	(0.0)	5	(6.7)	1	(1.3)
3	1	(<1)	13	(5.9)	3	(1.4)	36	(16.3)	89	(40.3)	55	(24.9)	2	(<1)	18	(8.1)	4	(1.8)
4	0	(0.0)	0	(0.0)	0	(0.0)	6	(9.7)	34	(54.8)	13	(21.0)	1	(1.6)	6	(9.7)	2	(3.2)
5	0	(0.0)	3	(5.8)	0	(0.0)	7	(13.5)	27	(51.9)	11	(21.2)	0	(0.0)	4	(7.7)	0	(0.0)
6	1	(3.6)	2	(7.1)	2	(7.1)	3	(10.7)	9	(32.1)	7	(25.0)	0	(0.0)	4	(14.3)	0	(0.0)
7	2	(9.1)	0	(0.0)	1	(4.5)	3	(13.6)	7	(31.8)	5	(22.7)	0	(0.0)	4	(18.2)	0	(0.0)
8	0	(0.0)	1	(10.0)	0	(0.0)	1	(10.0)	2	(20.0)	3	(30.0)	0	(0.0)	3	(30.0)	0	(0.0)
9	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	2	(40.0)	2	(40.0)	0	(0.0)	1	(20.0)	0	(0.0)
10	0	(0.0)	0	(0.0)	1	(16.7)	1	(16.7)	1	(16.7)	2	(33.3)	1	(16.7)	0	(0.0)	0	(0.0)
11	0	(0.0)	1	(25.0)	0	(0.0)	1	(25.0)	0	(0.0)	2	(50.0)	0	(0.0)	0	(0.0)	0	(0.0)

*A pattern is considered positive (negative) if the district mean NCE increases (decreases) by more than 1.0 NCE between two testing points. Otherwise it is considered to be the "same."

**Same/Same means that the gain was less than 1.0 (Same) for pretest to posttest and that the gain was less than 1.0 (Same) for posttest to sustained effects measure.

Discussion

It is anticipated that students who exit from the Title I program after one or more years of participation should demonstrate positive NCE gains that disqualify them from future program participation. Such gains may place students above the national average or above criteria used to indicate the most needy. However, students who continue in the program could exhibit any one of three different patterns. Continued students could demonstrate gains due to project participation, but such gains might not be large enough to prohibit further participation. Two other possible results might be that these continued students exhibit little or no growth or even decline since they have been the least successful students. This study has demonstrated that the pretest-to-posttest gains are not only generally positive, but are of a magnitude that equals the gains made by Title I students in general (Anderson, 1982).

A second year of participation in the Title I program should not only sustain the first year gains for continued students, but should enhance them as well. Previous studies have indicated annual gains (e.g., fall/fall or spring/spring) are considerably smaller than fall/spring gains (Anderson, 1982). The sustained effects gains for continued students exhibited in this study parallel the annual gains for Title I students in general (Anderson, 1982).

The patterns of study results support the effectiveness of continuing Title I services for eligible students. Almost 60 percent of the districts exhibited positive sustained effects patterns from continuing services. Only three percent of the district studies resulted in no overall project effects, and less than 25 percent showed negative effects due to a second year of participation.

An extremely interesting and satisfying corollary to this study was the number of districts that went considerably beyond the minimum requirements for

conducting their sustained effects studies. During the initial workshop blitz across the state, time was set aside for individual and small group consultations with LEAs to discuss potential sustained effects studies. Some LEA personnel had attended an earlier workshop on sustained effects at a statewide meeting where the handbook was introduced. Consequently, about half of these people had already completed their sustained effects studies. Appendix B contains four examples of these consultations illustrating the range and ingenuity of study designs. While it is impossible to describe adequately the scope and substance of the many consultations, the authors have summarized four. It is hoped that these summaries will convey some of the variety, enthusiasm, and problem-solving experienced by both technical assistance staff and participants. Without exception, consultative interactions emphasized local interest in designing, collecting, and using relevant evaluation information for program improvement and greater student achievement. Also included in Appendix B are two LEA-generated sustained effects reports that illustrate some uses made of these sustained effects studies.

Conclusions

This study demonstrated that a statewide model for conducting sustained effects evaluations can be implemented successfully given sufficient planning, flexibility, and technical assistance. Further, these studies can be implemented quite easily and generate considerable interest above and beyond the minimum study requirements. The sustained effects evaluation requirement successfully uses local evaluation data generated for national educational purposes. In many instances, it has made federally mandated evaluation data relevant to the local level for the first time.

Analysis of the data generated by this study supports Title I program effectiveness. Not only are positive annual results being obtained, but they are being sustained over at least two years of program participation.

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Appendix A

Sustained Effects Study
Summary Sheet

District: _____ Intermediate Unit Number: _____

What evaluation question did you try to address with this study? (Check one)

☐ On the average, do students who completed our third grade Title I reading program in 1979-80 sustain their achievement gains when participating in Title I the next year as fourth graders?

☐ On the average, do students who completed our _____ grade Title I _____ program in _____ sustain their achievement gains when participating in Title I the next year as _____ graders?
(specify grade) (specify subject matter) (specify year)

☐ Other; please specify: _____

Sustained Effects Testing Cycle (Check one)

	<u>Pretest</u>		<u>Posttest</u>		<u>Sustained Effects Measure</u>
☐	Fall	--	Spring	--	Spring
☐	Fall	--	Spring	--	Fall
☐	Fall	--	Fall	--	Fall
☐	Spring	--	Spring	--	Spring
☐	_____				Other; please specify

Subject Matter of Study (Check one)

- ☐ Reading
- ☐ Mathematics
- ☐ Language Arts

Grade Level At Pretest (Check one)

☐ 2 ☐ 5 ☐ 8 ☐ 11

☐ 3 ☐ 6 ☐ 9 ☐ _____

☐ 4 ☐ 7 ☐ 10

Other: specify _____

Testing Instruments Used

Pretest Measure

Posttest Measure

Sustained Effects Measure

Sustained Effects Results*

<u>Type of Student</u>	<u>Number of Students</u>	<u>Average Scores (in NCEs)</u>		
		<u>Pretest</u>	<u>Posttest</u>	<u>Sustained Effects</u>
Title I students for all three testing points (continued students)	_____	_____	_____	_____
Title I students for pretest and posttest only (exited students)	_____	_____	_____	_____
Control group students (not in Title I during pretest, posttest, or sustained effects measurement)	_____	_____	_____	_____

*Note: Enter results only for sustained effects studies actually completed. If you used scores other than NCEs, a different type of student than the types listed, or had any other unusual or different conditions, please explain below.

Appendix B

Stimulating Good Evaluation Practice
Through Sustained Effects Studies:
Some Illustrative Case Narratives

During May of 1982, members of the Region III Title I Evaluation Technical Assistance Center (TAC) met with local administrators and teachers throughout Pennsylvania to discuss conducting sustained effects evaluation of Title I. Specifically, TAC conducted 12 regional workshops. Each workshop provided a general two-hour presentation on sustained effects studies followed by individual consultations with districts requesting further assistance and guidance.

The initial focal point of the workshops was user-training for the Pennsylvania sustained effects evaluation model. This model, designed by TAC in conjunction with the Pennsylvania Department of Education (PDE), allowed school districts to address quickly and easily one research question about the long-term effects of their Title I programs:

"On the average, do students who completed our third grade Title I reading program in 1979-80 sustain their achievement gains when participating in Title I the next year as fourth graders?"

While procedures required to implement the Pennsylvania evaluation model (hereafter called the PA model) were described in detail during the general presentation, it was also emphasized that employing an alternative sustained effects evaluation design was allowed, and indeed encouraged, if a research question other than the one posed in the PA model was considered more appropriate for local decision-making. Several examples of alternative research questions and how they could be addressed in a sustained effects evaluation were presented during the general session.

TAC objectives for conducting the sustained effects workshops were twofold. First, it was important to insure that districts throughout the state had the requisite knowledge and understanding to conduct a sustained effects

evaluation that would comply with Federal and state evaluation requirements. More importantly, however, was the desire to excite districts about the substantive merit of sustained effects evaluations so that they would view them as a serious exercise worthy of careful planning and analysis. The workshop and consultations emphasized using these program evaluations to communicate program impacts and stimulate future program changes.

The following are brief descriptions of four TAC field consultations and LEA-generated sustained effects study reports* which illustrate achievement of both workshop objectives. They are significant, in our view, because they reflect a local orientation that needs to be fostered if Title I evaluations are to be locally useful. Experiences in the field, as illustrated by these case narratives, also lend support to our belief that improved local evaluation practices are best engendered when the initial question posed is; "What would you like to know about your program?" rather than "What do you need to report about your program?"

*These reports have been edited to ensure confidentiality and increase readability in this context. No substantive changes have been made.

Consultation A

After attending a two-hour workshop on conducting a sustained effects study, this Title I Coordinator gathered and analyzed data on the local secondary program. The LEA serves 50 students in grades 7-12 through a pull-out reading program of 3 days per week for 30 minutes per day.

Initial Concerns

Because Title I served grades 7-12, this local coordinator was unable to use the PA model which tracks the performance of third and fourth graders. However, the presentation provided enough information on sustained effects so that s/he could modify the PA model to meet local conditions.

The coordinator was most concerned about the smaller number of students at any one grade level. A single aberrant score could greatly affect study results due to the small sample size.

During the consultation, it was decided to study all students, regardless of grade level, who participated in Title I for two consecutive years, 1979-80 and 1980-81. It was also decided that a fourth data point, Spring of 1982, would be added to obtain more program information for the current sustained effects evaluation and to establish a baseline data point for the next sustained effects study to be conducted during the Fall 1982-Spring 1985 reporting period.

Study Results

When the data for all continuing students in all grade levels (7-12) were analyzed, the results showed an approximate gain of 6 NCEs during the first year of participation. This gain was sustained and also enhanced by another approximate 6 NCE gain during the second year of Title I participation. Data from 1982 were unavailable as yet for analysis. While the coordinator

was pleased with these results, s/he had questions that were not answered by this particular study. This questions included:

- o Are there specific grade levels where the program has better long-term effects than at other grade levels?
- o Do exited students exhibit the same sustained effects pattern as continued students?
- o How do the short-term achievement gains in the program compare with secondary programs in PA and the nation?

Future Plans

Based on the unanswered questions and the availability of district-wide test data on all students, this LEA coordinator decided to conduct another sustained effects study using the same study design that would follow students who exited from the Title I program after the 1979-80 school year. S/he also decided to disaggregate the data on both continued and exited students by grade level to see if there was any indication of increased program effectiveness at specific grade levels. The coordinator was aware of data reliability problems associated with small numbers of students, but s/he felt that grade level information could be important in designing future evaluation studies to support program decision-making.

As a result of this consultation, the coordinator also decided to make use of comparative Title I test data from PDE and the nation in future reporting to interested parties in the LEA. Additionally, s/he plans to evaluate the long-term effectiveness of district reading services in the elementary grades using a design similar to the Title I sustained effects study.

Consultation B

After attending a two-hour workshop on conducting a sustained effects study, this Title I Coordinator sought further assistance in planning the LEA study. Title I serves 30 children, grades 1-6 in a pullout reading program in this LEA.

Initial Concerns

Unique conditions in this LEA concerned the coordinator. The Title I program was changed considerably after the 1979-80 school year. In addition, 1980-81 Title I services for children did not begin until February. Furthermore, when 1979-80 pre and posttest scores were matched with '81 posttest scores, only three 3rd graders and four 4th graders qualified for the study.

Future Plans

In reviewing LEA characteristics, it was determined that spring district-wide test scores were available each year for every grade. Therefore, it was decided that these scores would be used for the study. Spring 1980 scores would be the pretest, spring 1981 scores would be the posttest, and spring 1982 scores would be the sustained effects measure. Since there were so few children in the program, the coordinator decided to study Title I children in all grade levels in 1980-81 so as to determine both the short and long-term effectiveness of the new program implemented during that school year. Additionally, since test scores from the same instrument were available for both continued and exited students, the coordinator decided to compare these students in a separate study.

After the Spring 1982 data are available, the coordinator will complete the study and discuss the results and possible interpretations with the Regional TAC. At that time, the coordinator will plan a sustained effects study

for the 1982-85 evaluation cycle. S/he is currently considering annual updating of the present study to establish a longitudinal perspective of the program's effectiveness.

Consultation C

After attending a two-hour workshop on conducting a sustained effects study, this LEA representative completed the PA Model study. During a consultation with TAC, study results were reviewed and discussed.

Initial Concerns

The results of the PA Model Sustained Effects Study in this LEA showed an approximate gain of 8 NCEs for students in the third grade reading program from Fall 1979 to Spring 1980. The sustained effects measure from Spring 1981 showed that students who continued in the Title I reading program during fourth grade sustained the 1979-80 gain but did not enhance it. The LEA representative had two major concerns about these results. The first concern dealt with the small number of students (13) available for the study and the effect on data reliability. The second concern was the lack of continued student growth during a second year of Title I services.

In reviewing individual student test data, two problems surfaced. Several aberrant scores were affecting the group data, and there were at least four students who were eligible for the study, who had raw scores reported for the pretest measure, but who had no corresponding percentile score recorded. As reasons for the missing scores were explored, several problems with the entire Title I testing program became apparent.

- o Fall pretests were administered more than 6 weeks before the empirical norming dates.
- o Functional level testing was allowed but not required, and no consistent guidelines on out-of-level testing were followed.
- o Fall pretests were also used to select students for Title I services.

Each of these problems raised substantial concerns about the reliability and validity of the Title I growth estimates.

Future Plans

In discussing ways to improve the data quality for future studies, new student selection strategies were first discussed. This LEA representative was most interested in obtaining information on using measures such as objective teacher rating scales, basal series test scores, and criterion-referenced measures. TAC subsequently provided an information packet on student selection. Since district-wide testing occurs every other year in alternate grades, consideration will be given to incorporating district-wide data if data reliability and validity can be increased.

Possible sustained effects study questions of interest to this LEA were also explored. Differing program components were of prime concern. In this LEA, one building provides a different Title I program structure from the other three buildings. A future study may compare achievement patterns for students in grades 2 through 5 who remain in Title I a second year in the three buildings with a similar program to the same population in the one building with a different program.

This consultation provided an opportunity to discuss good evaluation practices in the context of local concerns and issues. The LEA representative left the session with a recognition of local testing problems, their possible solutions, as well as how a sustained effects evaluation can be designed to address a locally important question.

Consultation D

These two local Title I officials had already completed one sustained effects study using the PA model. In addition, they had conducted three other studies that incorporated the PA model and used the fourth, fifth and sixth grades as base years. They were clearly concerned about their findings and were anxious to talk to TAC staff about how they should be interpreted.

Initial Concerns

The district officials were troubled by findings that were consistent across all grade levels studied and showed small mean NCE losses between the Spring 1980 and Spring 1981 data points for students in the program two consecutive years. Even though the long term trend from the Fall of 1979 to the Spring of 1981 was clearly positive for all grade levels studied, the officials wanted guidance on interpreting the absence of demonstrated growth in the second year. More pointedly, they wanted to know how they could best communicate this apparently negative finding to a school board and Superintendent who have been openly skeptical about the value of the Title I program. This latter concern led to a more general discussion regarding the kinds of sustained effects studies which could provide convincing evidence of the long term worth of Title I in this district.

Future Plans

Based on this district's concerns about interpreting their second year loss findings and demonstrating the overall value of the Title I program, two strategies were developed. First, it was decided that a fourth data point, Fall of 1980, should be added to the existing studies. By adding this additional data point, the district can determine how much of the reported second year NCE losses to attribute to summer effects as opposed to second year program effects.

Next, a new sustained effects study was planned to demonstrate the overall value of Title I. This study will use annual district-wide test data to compare the long-term (two year) growth of Title I students to a control group of students in the same grade with comparable pretest scores who did not receive Title I because they resided in ineligible attendance areas. Separate studies will be conducted for each grade level with a Title I program. Study findings at each grade level for the Title I and control groups will be graphed to clearly illustrate the relative value of Title I to interested parties.

After these studies are completed, district officials indicated that they might wish to conduct other studies that could demonstrate the long-term effectiveness of Title I. One of the proposed studies would track the progress of Title I and control group students over three and four year periods. In another, the long-term progress of continued versus exited Title I students would be compared. It was clear that the workshop and subsequent consultation provoked a new understanding in these educators of the value and feasibility of conducting sustained effects evaluations and communicating program information to local decision-makers.

Title I Sustained Effects Study Report #1
April, 1982

Introduction

Under ESEA Title I and new ECIA Chapter 1 legislation, school districts are required to conduct studies to determine whether or not Title I achievement gains are sustained over a period of 12 months or longer. These studies must be conducted once every three years. The first three year cycle ends on June 30, 1982. Local districts were first made aware of this requirement in April, 1981 and the model for conducting these studies was provided to local districts in April, 1982. It was necessary, therefore, to use data already collected in previous years to complete this study.

Pre- and posttest data from Fall, 1979; Spring, 1980; Fall, 1980; and Spring, 1981 was used. Students for whom appropriate data were available were included in the study. Due to the extremely small samples collected, a decision was made to include all possible grade levels in the study. A total of 38 students in grades 2-9 qualified.

The guidelines specify that normal curve equivalent (NCE) scores are to be used. These scores are similar to percentiles, in that they indicate a student's relative position or rank among all students included in the norming sample. Normal curve equivalent scores differ from percentiles in that they represent equal intervals along a bell-shaped curve while percentiles are based on the distribution of scores along the curve.

The following categories of students were not included in the sample:

- (1) Title I students who entered the program after October, 1979.
- (2) Title I students who left the program prior to May, 1981. This group includes students who were dismissed from the program and mainstreamed into the regular school program without additional services. While the guidelines permit local districts to include these students in the study, we were not aware of this option in the spring of 1981 when data should have been collected. Given our declining resources, and the expense and time of testing students not currently in need of services, this option has a low priority. We can only assume that since mainstreamed students have been able to function without additional help, they have sustained their Title I achievement gains. The results of an informal study requested by the Department of Education showed that 30% of our elementary Title I students and 10% of our secondary students are returned to the regular classroom for a period of at least two years.
- (3) Title I students in the following grades: kindergarten, one, ten, eleven, and twelve. The guidelines specify that students in kindergarten and first grade should be eliminated when possible since normed tests tend to be less reliable for younger students. Students in grades ten, eleven, and twelve were eliminated because normal curve equivalent scores are not available. The number of tests on the

market yielding fall and spring data for high school students is minimal. None of these tests permits functional level testing. The district has discussed this problem with the TAC and the Pennsylvania Department of Education, but the problem has not been resolved.

- (4) Title I students who moved from grade six to grade seven during the time of the study were excluded. The test used for data collection in grade six is different from that used in grade seven. These tests measure slightly different abilities and are not comparable.

Procedures

- (1) Students were identified. Pre- and posttest scores from the June, 1980 and June, 1981 Annual Performance Reports (Part 2A) were reviewed and matched.
- (2) Grade mean scores were determined for Fall, 1979; Spring, 1980; Fall, 1980; and Spring, 1981.
- (3) Mean scores were plotted on the "Sustained Effects Plotting Graph" provided by the TAC.
- (4) Results were studied to determine:
 - (a) On the average do students participating in the Title I program sustain their achievement gains when participating in the program during the subsequent school year?
 - (b) What happens to Title I students over the summer months when instruction is not provided?

Results

The following results were obtained in the portion of the study examining Title I students' ability to sustain achievement over a period of time:

<u>Grade 79-80/80-81</u>	<u># of Students</u>	<u>Mean NCE Fall '79</u>	<u>Mean NCE Spring '80</u>	<u>Mean NCE Spring '81</u>	<u>Net Gain/Loss Spring to Spring</u>
2 / 3	7	37	39	35	-4
3 / 4	6	34	40	42	+2
4 / 5	4	25	29	33	+4
5 / 6	5	30	35	30	-5
7 / 8	8	16	22	32	+10
8 / 9	8	18	28	31	+3
District	38	25.6	31.6	33.7	+2.1

The following results were obtained in the portion of the study dealing with student gains or losses in achievement during the summer months.

<u>Grade 79-80/80-81</u>	<u># of Students</u>	<u>% of Students Showing Losses</u>	<u>Mean NCE Spring '80</u>	<u>Mean NCE Fall '80</u>	<u>Net Gain/Loss Spring to Fall</u>
2 / 3	7	85.7%	39	34	-5
3 / 4	6	83.3%	40	36	-4
4 / 5	4	25.0%	29	33	+4
5 / 6	5	100.0%	35	29	-6
7 / 8	8	50.0%	22	25	+3
8 / 9	8	87.5%	28	17	-11
District	38	71.0%	31.6	28.1	-3.5

Conclusions

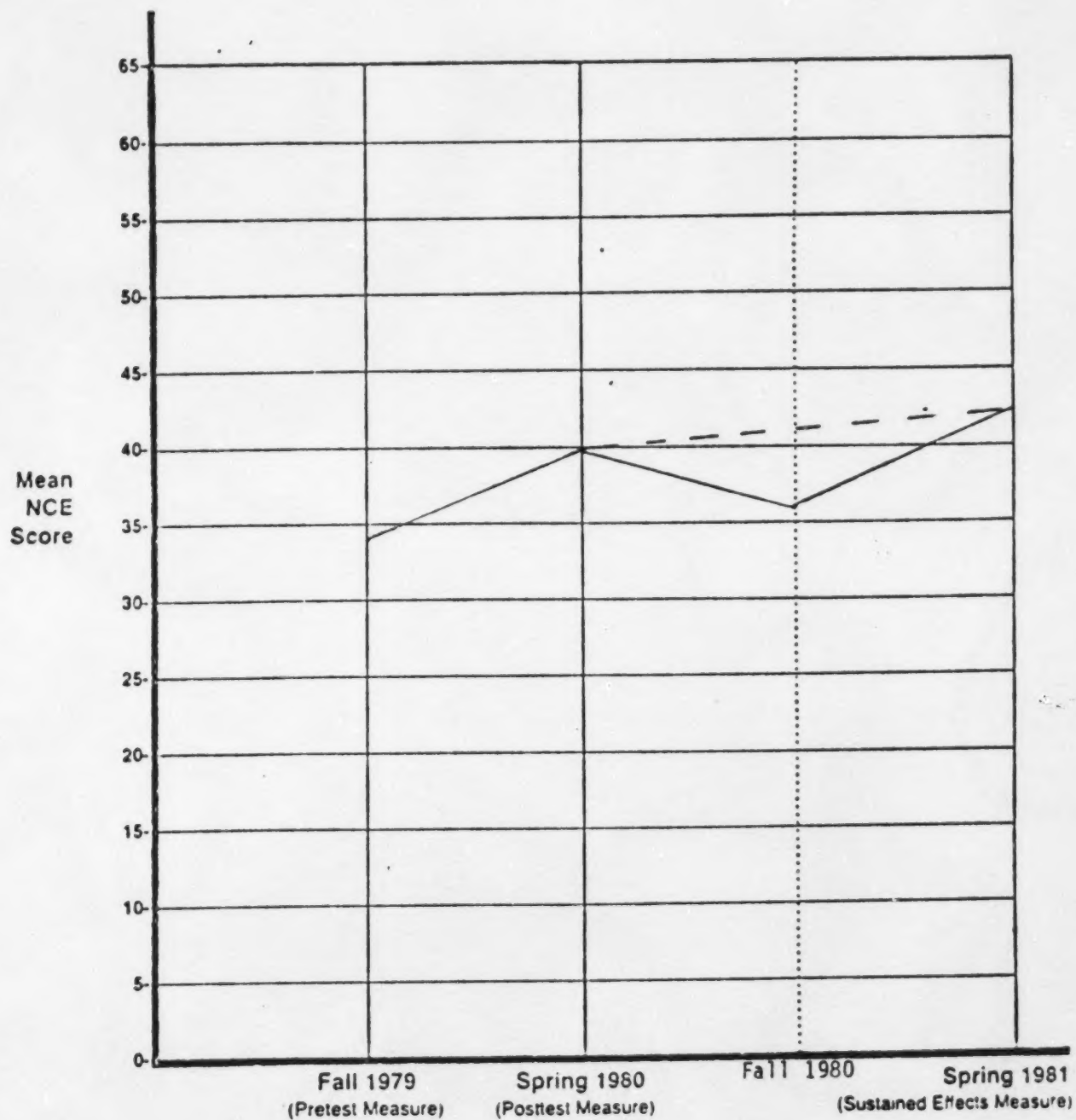
Study results should be interpreted with caution because of the small number of program participants. This study examined approximately 10% of the total number of students receiving Title I services during the years under study. The Title I program involves a very mobile population. Many students enter and leave the program during the course of a school year. As students improve they are dismissed. Other students may transfer to special education programs, move, or drop out of school.

Study results indicate that students are, on the whole, able to sustain those gains made during the course of one year of Title I services for a period of 12 months. In those grades that did not show this sustained effect, the students made short term gains during the two program years, but sustained greater losses over the intervening summer.

With respect to summer gains or losses, 71% of the students examined showed losses over the summer months. The Title I staff has, over the years, developed parent manuals and other suggestions for ways parents might help their children at home. It would appear, on the basis of this very limited study, that the impact of these materials is relatively low. Private tutorial help is available on a limited basis, but it is prohibitively expensive for many Title I students. Summer programming, similar to the district's Title I program as it existed prior to 1975, might help students maintain achievement levels. In light of the decline in federal and state financial support for such programs, it is unlikely that this option would be instituted in the foreseeable future. Since most students make up these losses during the regular program year and go on to make some gains, it appears that the school year Title I program is more beneficial than a summer program alone.

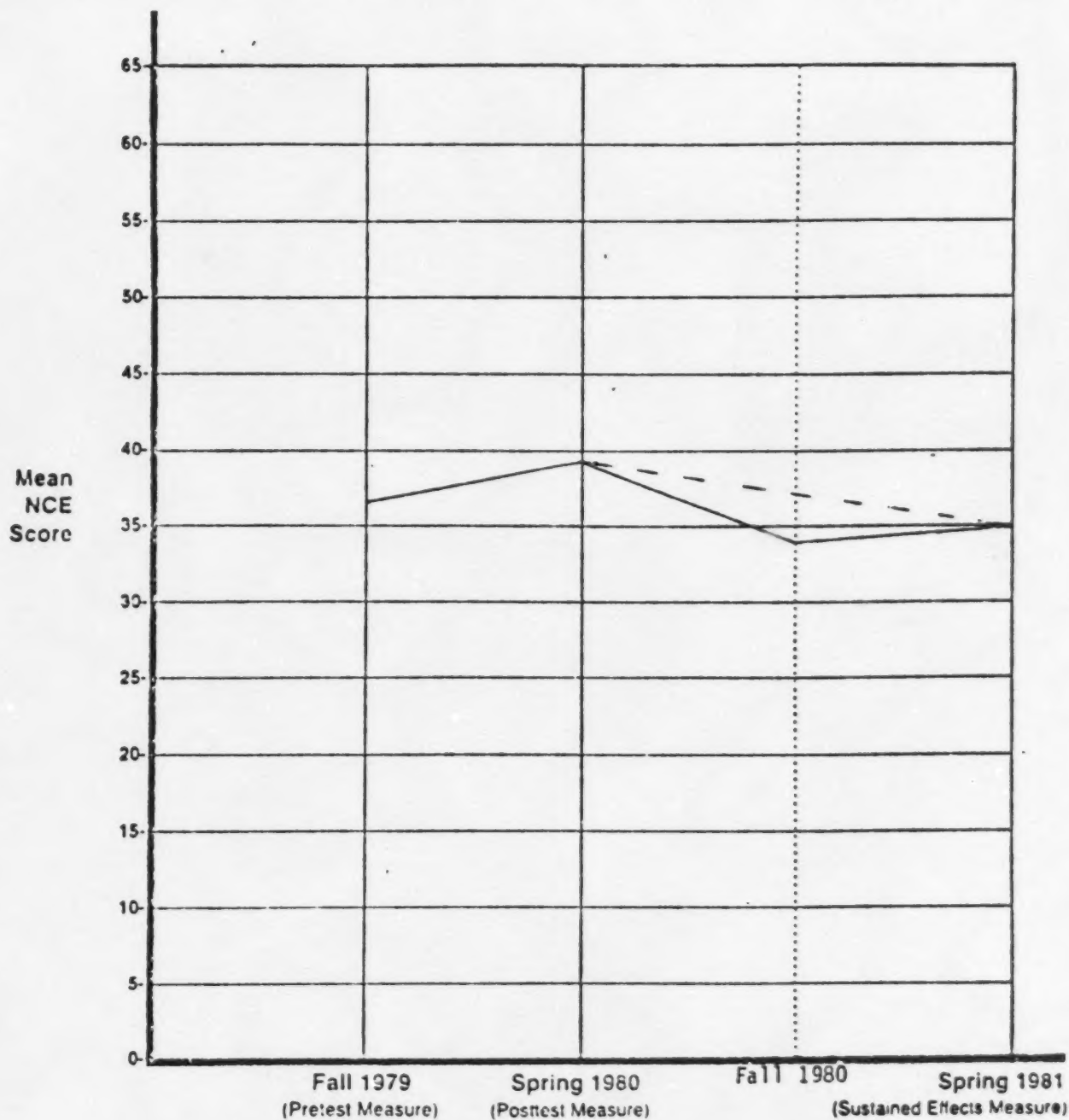
In the unlikely event that additional manpower and time should become available, it might be worthwhile for future studies to include data on those students dismissed from the program and returned to the mainstream. This would require additional testing materials and time to conduct testing.

GRADE 3 - GRADE 4
N = 6



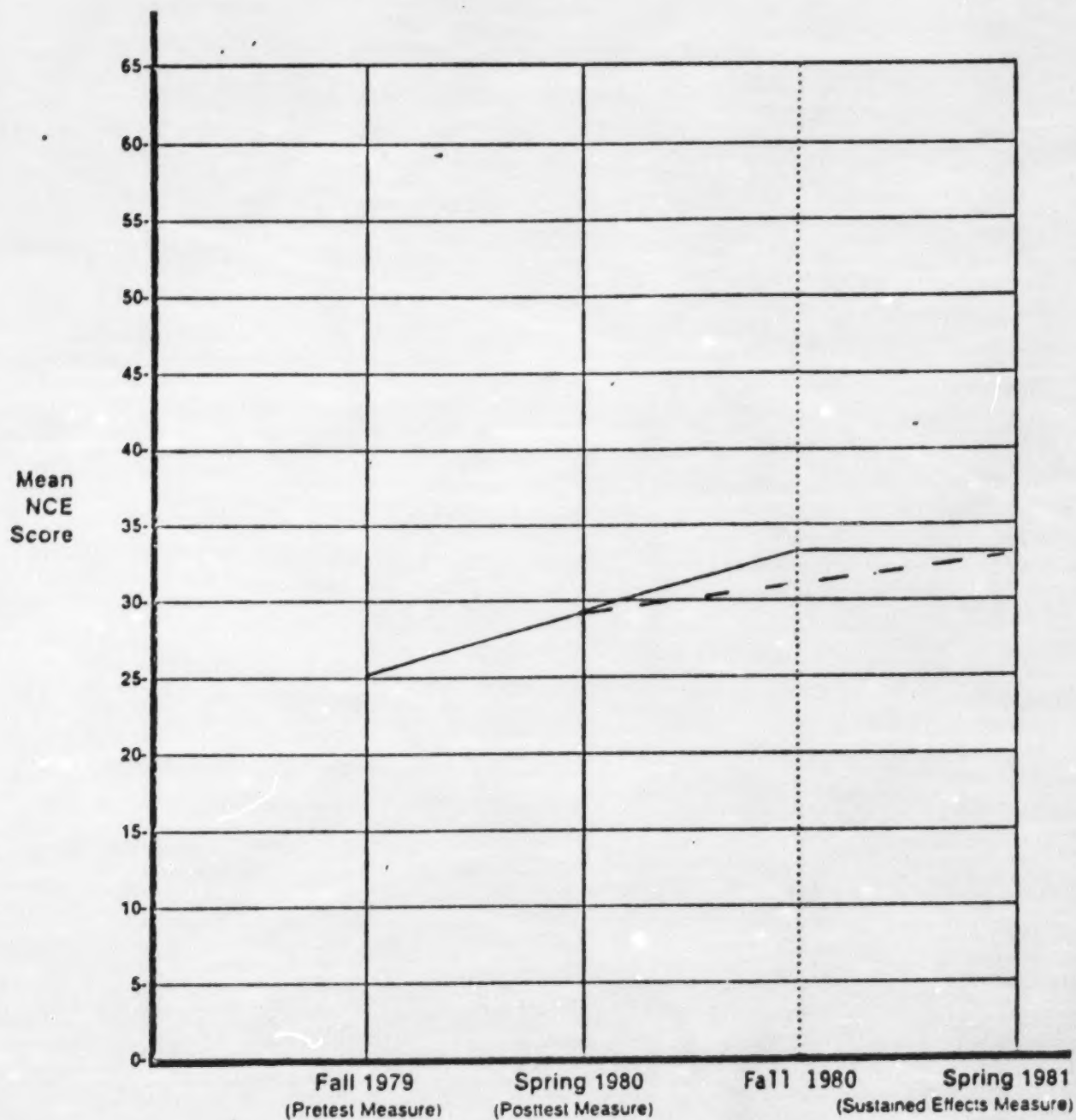
Sustained Effects Plotting Graph

GRADE 2 - GRADE 3
N = 7



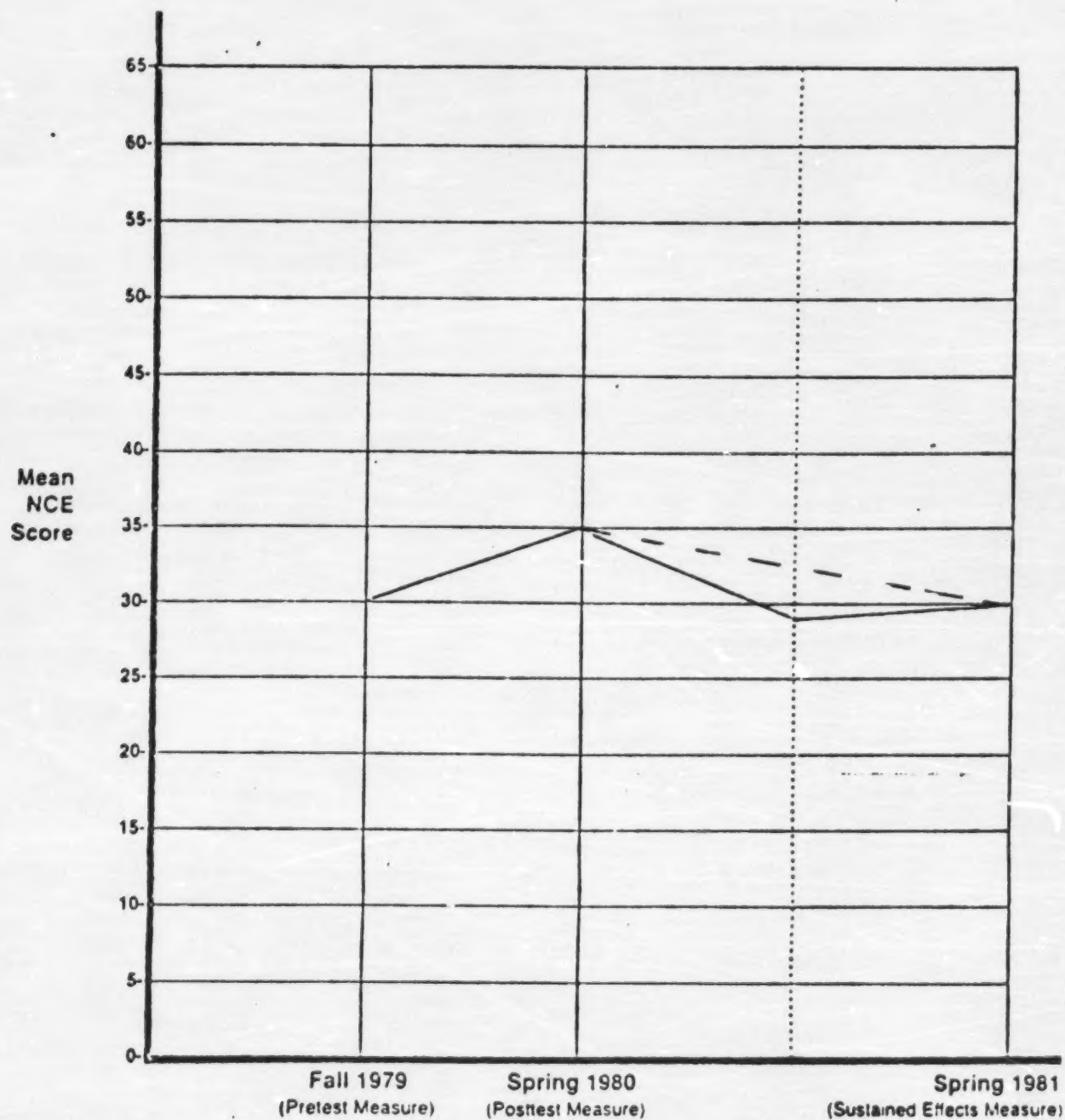
Sustained Effects Plotting Graph

GRADE 4 - GRADE 5
N = 4



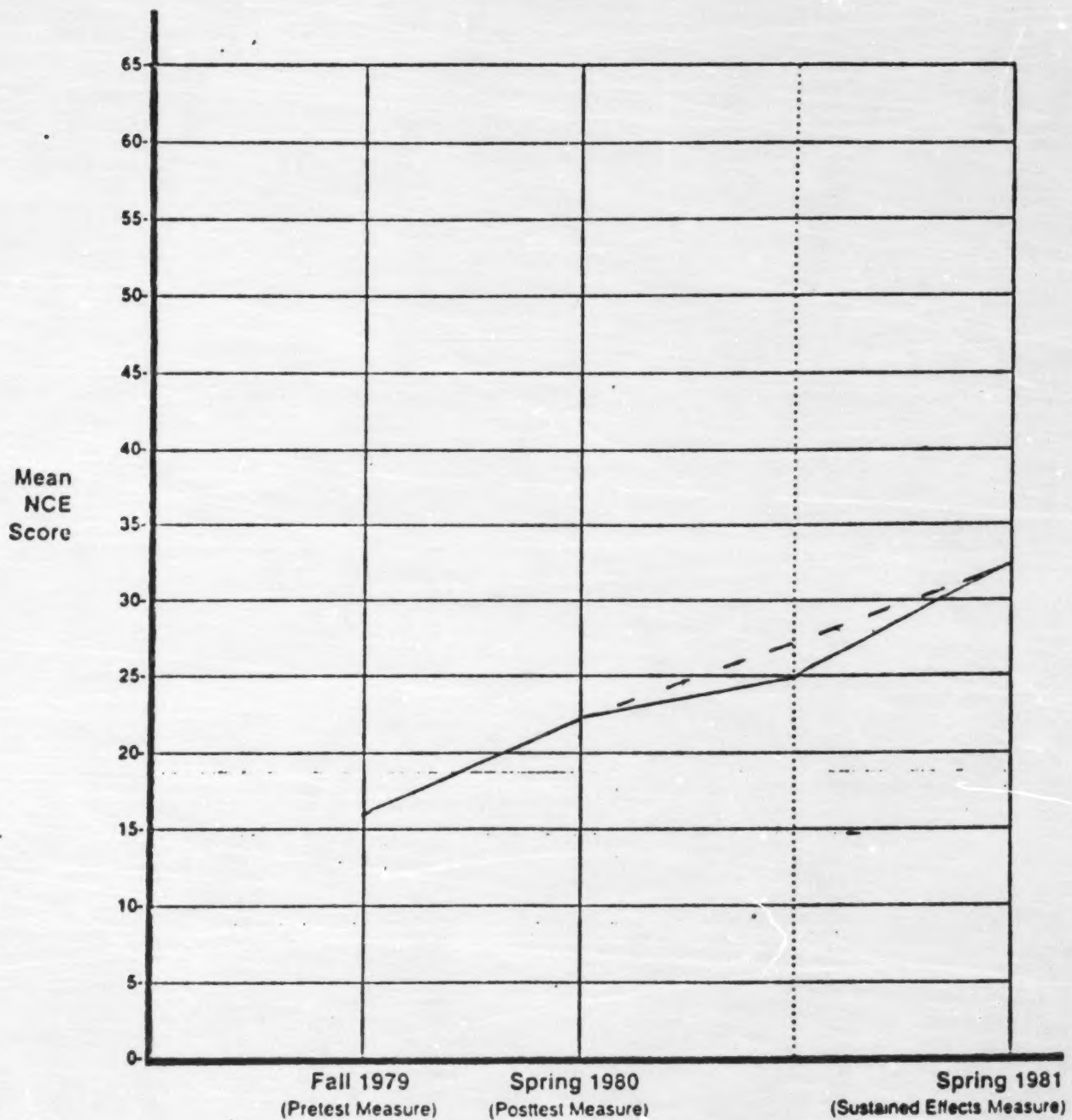
Sustained Effects Plotting Graph

GRADE 5 - GRADE 6
N = 6



Sustained Effects Plotting Graph

GRADE 7 - GRADE 8
N = 8



Sustained Effects Plotting Graph

Title I Sustained Effects Study Report #2

Pennsylvania's Title I Office required that all of the school districts in the state complete a sustained effects study of their Title I programs. The Pennsylvania Model stipulated that:

at least once in each three year cycle a study of Title I students be made to determine whether achievement gains are sustained;

the measure of sustained effects must be administered at least twelve months later than the pretest administered for the project evaluation;

the district must use the results for planning and to improve the project in the future; and

data resulting from the measurement of sustained effects should be kept available for inspection for a period of five years from the date of the measurement or until any pending federal audit is resolved.

The first three year cycle ended on June 30, 1982. This model also recommends the districts focus on all students in the Title I program at one grade level who remain in the program for two school years.

In our completion of this study we chose to go beyond these minimal requirements. This Sustained Effects Study included all students in grades four through eight during the 1979-80 school year. Their growth in reading was plotted over a three year period, not two. Our study also included students who were phased out of the program.

This expanded study enabled us to find answers to several important questions.

1. Did Title I students achieve greater gains in positional status in terms of the national norm than non-Title I students over the course of the study?
2. Did students who participated in our Title I program in 1979-80 sustain their achievement gains when participating in Title I over the next two years?
3. Did students who participated in our Title I program in 1979-80, but who were phased out of the program sustain their achievement gains after being removed from the program?
4. Should students who are above the Title I regulation eligibility score but below the national average be maintained in the Title I program?

Second and third graders were not included in the study because there were not enough of them participating in the program to make any reliable generalizations. Ninth and tenth graders were not included because we have no reading achievement tests outside of Title I at these grade levels to measure sustained growth.

A control group of elementary students who did not participate in Title I was compared to the Title I group. This study is based on the premise that the control group, which does not have the Title I treatment, should remain constant in their national normed group standing. This was true in our study. A control group of 37 students selected at random had the following post test NCE* score averages from 1979-80 to 1981-82:

1979-80	58.5 NCE average
1980-81	58.5 NCE average
1981-82	59.7 NCE average

In light of these results the reasonable assumption that can be made is that if there is a significant gain in NCE achievement or standing it can be attributed to the Title I treatment and not to the regular curriculum.

TABLE I

The results of our Sustained Effects Study for all Title I students are as follows: (The Title I students were given a pretest in 1979-80.)

	<u>Grades 4-6</u>	<u>Grades 5-7</u>	<u>Grades 6-8</u>	<u>Grades 7-9</u>	<u>Grades 8-10</u>
1979-80 Pre-Test NCE Average	28.4	33.4	34.8	24.2	34.2
1979-80 Post-Test NCE Average	37.5	39.6	39.8	26.7	40.9
1980-81 Post-Test NCE Average	41.8	47.1	41.8	33.9	37.1
1981-82 Post-Test NCE Average	46.0	45.5	44.9	40.8	37.6
Number of Students Tested	(26)	(24)	(22)	(6)	(7)

(See Exhibit A for additional information)

*Normal Curved Equivalents are a standard score system that have 99 equal intervals that can be averaged. Their 50th NCE corresponds to the 50th percentile. They have the same meaning from one test to another.

The answer to the first question in our study is yes, the Title I students did achieve greater gains in their positional status than the non-Title I students from 1979-80 to 1981-82. The non-Title I students selected at random achieved a 1.2 NCE gain from a 58.5 average to a 59.7.

The Title I Students achieve a gain of 10 NCEs or more at every grade level except one.

TABLE II

NCE Gains from 1979-80 to 1981-82

<u>Name of Group</u>	<u>NCE Range</u>	<u>Gain</u>
Control Group	58.5 to 59.7	+ 1.2
4-6 Title I Group	28.4 to 46.0	+17.6
5-7 Title I Group	33.4 to 45.5	+12.1
6-8 Title I Group	34.8 to 44.9	+10.1
7-9 Title I Group	24.2 to 40.8	+16.6
8-10 Title I Group	34.2 to 37.6	+ 3.4

The answer to the second question in our study is yes. All of the Title I groups, except one, not only sustained the growth they made in the first year of the study, they enhanced it. (This was not the case for the small group of students who went from grades 8-10 during the study.)

This sustained and enhanced effect is the best possible result we could expect to have. This means the effect is not a short range one. We can expect that the students who receive Title I instruction will continue to achieve at a higher educational level within their peer group.

This leads us to the third question in our study. It appears that the students who are phased out of the program are not only able to sustain their achievement status, but they actually enhance it. Table III illustrates the NCE growth of students who were in the Title I program in 1979-80, but were phased out of the program during the course of the study.

TABLE III

NCE Growth of Students Phased Out of the Title I Program

	<u>Grades 4-6</u>	<u>Grades 5-7</u>	<u>Grades 6-8</u>
1979-80 Pretest NCE Average	33.2	35.6	35.4
1979-80 Post-Test NCE Average	42.3	41.6	41.8
1980-81 Post Test NCE Average	45.5	50.8	45.5
1981-82 Post Test NCE Average	50.0	47.1	47.4

(Test scores for students phased out of the program beyond 8th grade are not available.)

This result is most satisfying. Many parents have concerns that without the continued support of Title I services their children will regress in terms of their reading skills and eventually require these special services again.

This has happened in a few instances, but it appears that the skills acquired are retained, and the students are able to apply them to new learning situations and maintain their positional status in the reading comprehension scale.

This information answers our third question in the study. Yes, the students, who participated in the program in 1979-80, but were phased out of the program after that, were able to sustain their achievement gains after Title I services were removed.

This leaves one question from the study remaining to be answered. Should students who are above the Title I regulation eligibility, but below the national average be maintained in the Title I program.

Title I regulations have a maintenance provision that allows students to stay in the program even though they are above the cutoff score used to define them as being educationally deprived. Title I staff members must justify why they are keeping the student in the Title I classes.

The decision is sometimes based on the subjective opinions of the Title I staff or the feelings of the regular classroom teacher. Even though other objective data may be available, it is a difficult decision to make, especially with older students who may feel they have "earned the right" to make it without the Title I services.

A longitudinal study such as this one can help to provide information that may be useful in making these decisions. There were only 19 students in this study who were maintained in the program even though they were above the cutoff score. It is difficult to make generalizations from this small a group.

This group sustained their achievement, but did not enhance it. Their average NCE score at the time they were maintained in the program was 44.8. A year later their NCE average was 43.5. A slight regression was experienced.

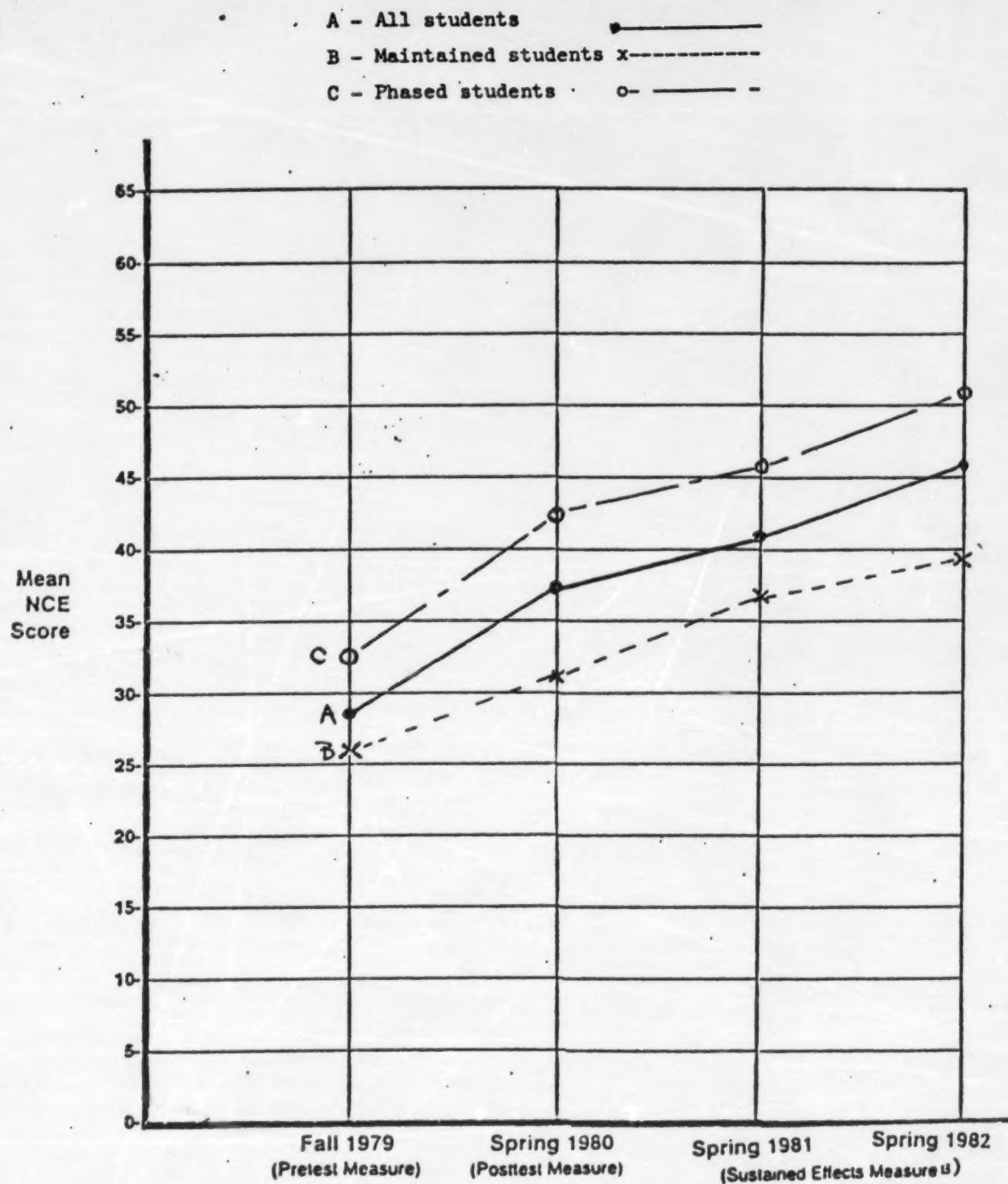
Based on this evidence it is impossible to answer the last question of our study conclusively. It appears there is a limit to the progress that we can make with our Title I students. That limit seems to be just below the 50th NCE.

When you consider that most of the students who enter the Title I program are achieving below the 35th NCE, reaching the 50th NCE is a considerable accomplishment.

This study offers additional evidence that our Title I program has provided a significant contribution to the education of our students. It is the most thoroughly documented program in our curriculum.

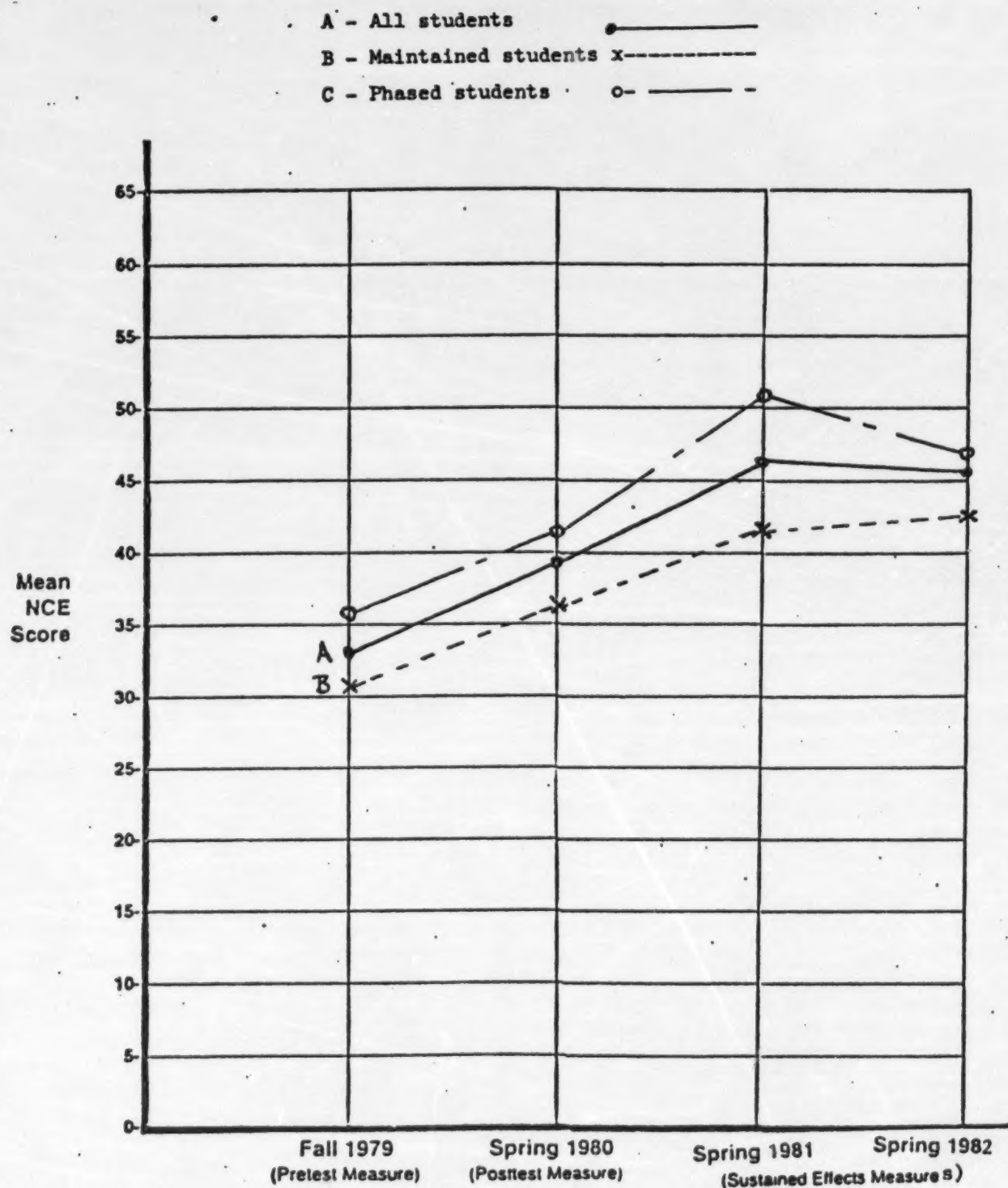
All of the evidence we have collected about the Title I program, including this longitudinal study, indicates that it is extremely worthwhile.

EXHIBIT A



Sustained Effects Plotting Graph A

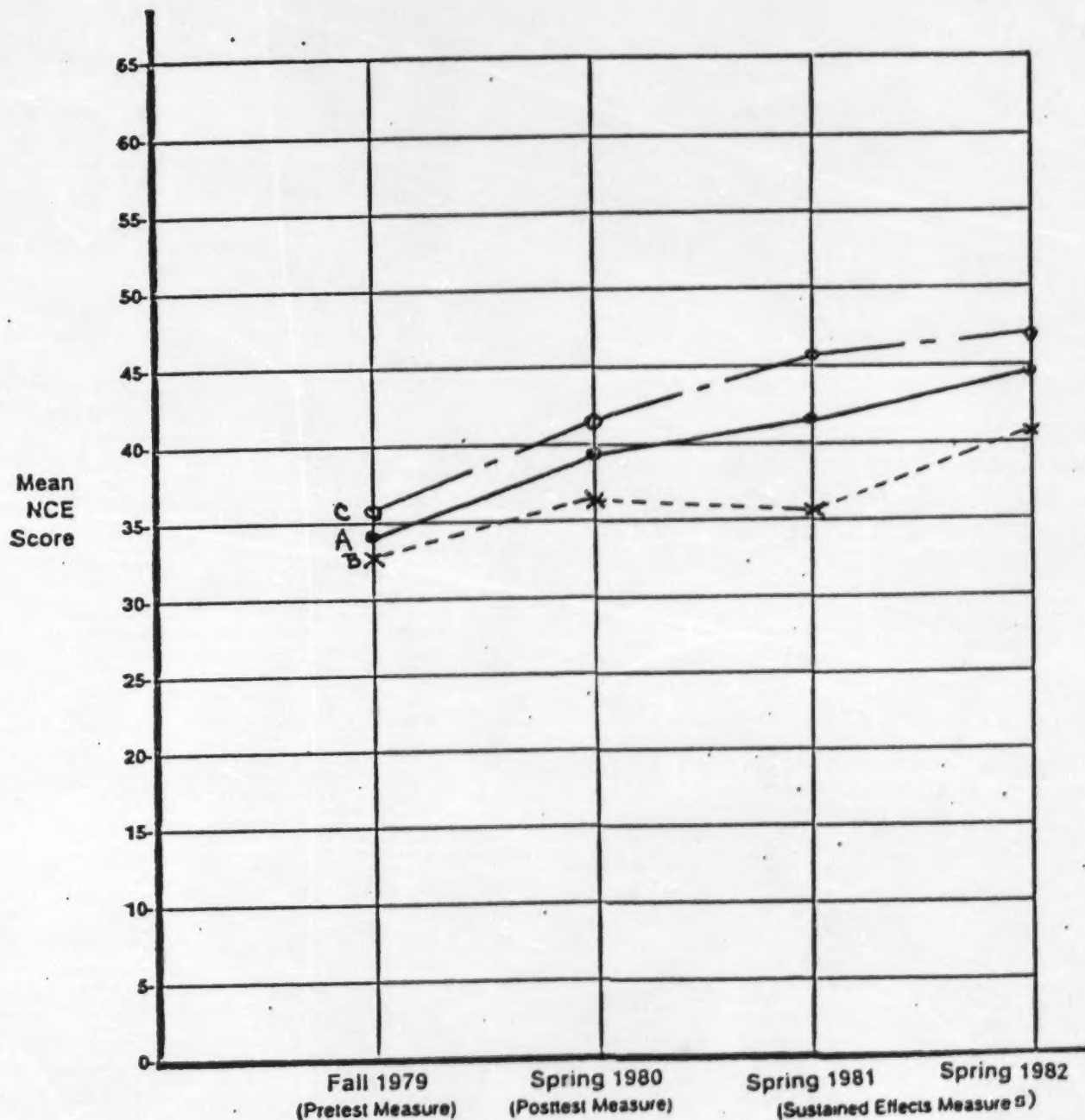
BUILDING _____ GRADE LEVEL 4-6 NO. OF STUDENTS 26



Sustained Effects Plotting Graph *B*

BUILDING _____ GRADE LEVEL 5-7 NO. OF STUDENTS 24

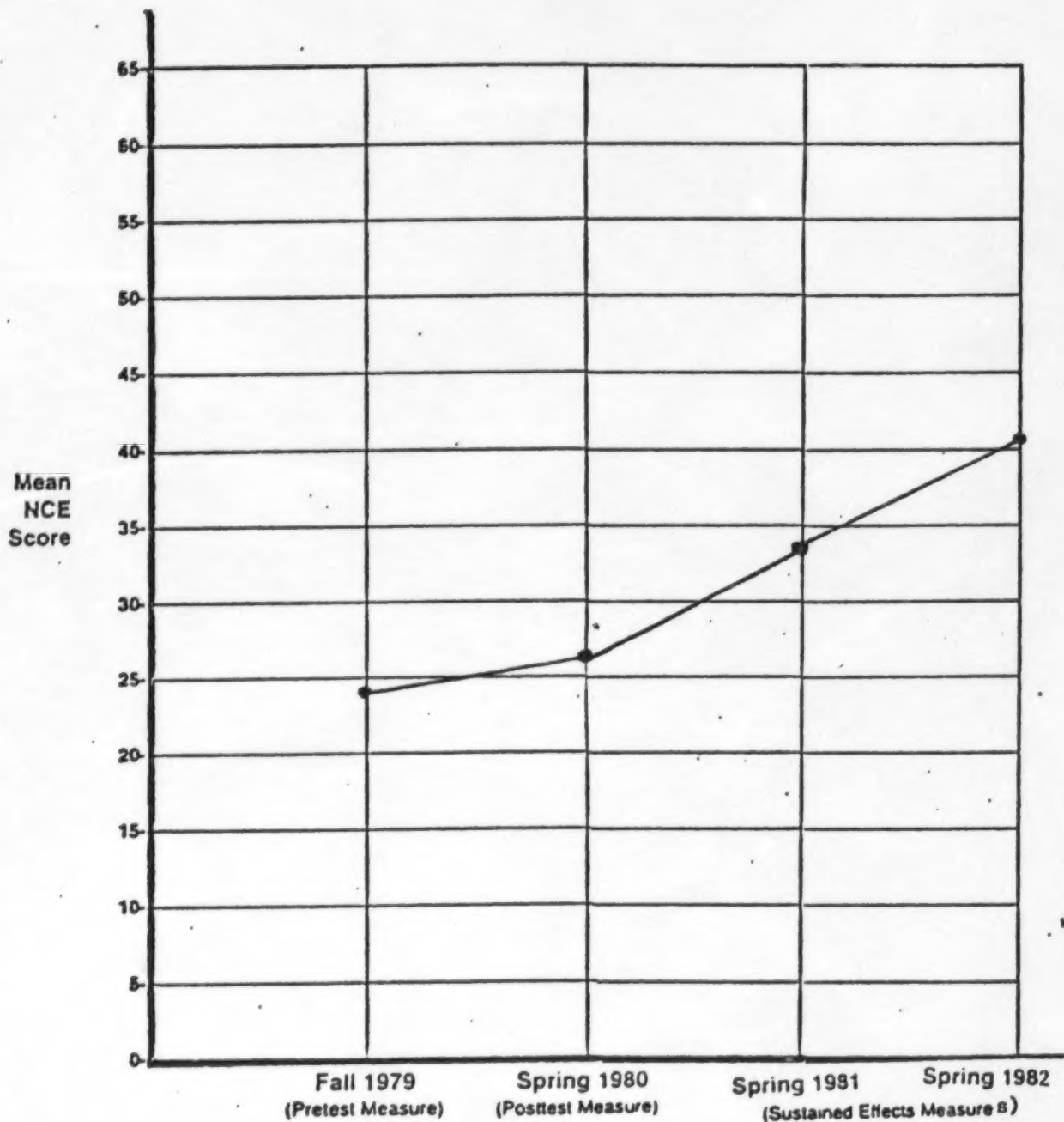
A - All students ● —————
 B - Maintained students x —————
 C - Phased students ○ —————



Sustained Effects Plotting Graph C

BUILDING _____ GRADE LEVEL 6-8 NO. OF STUDENTS 22

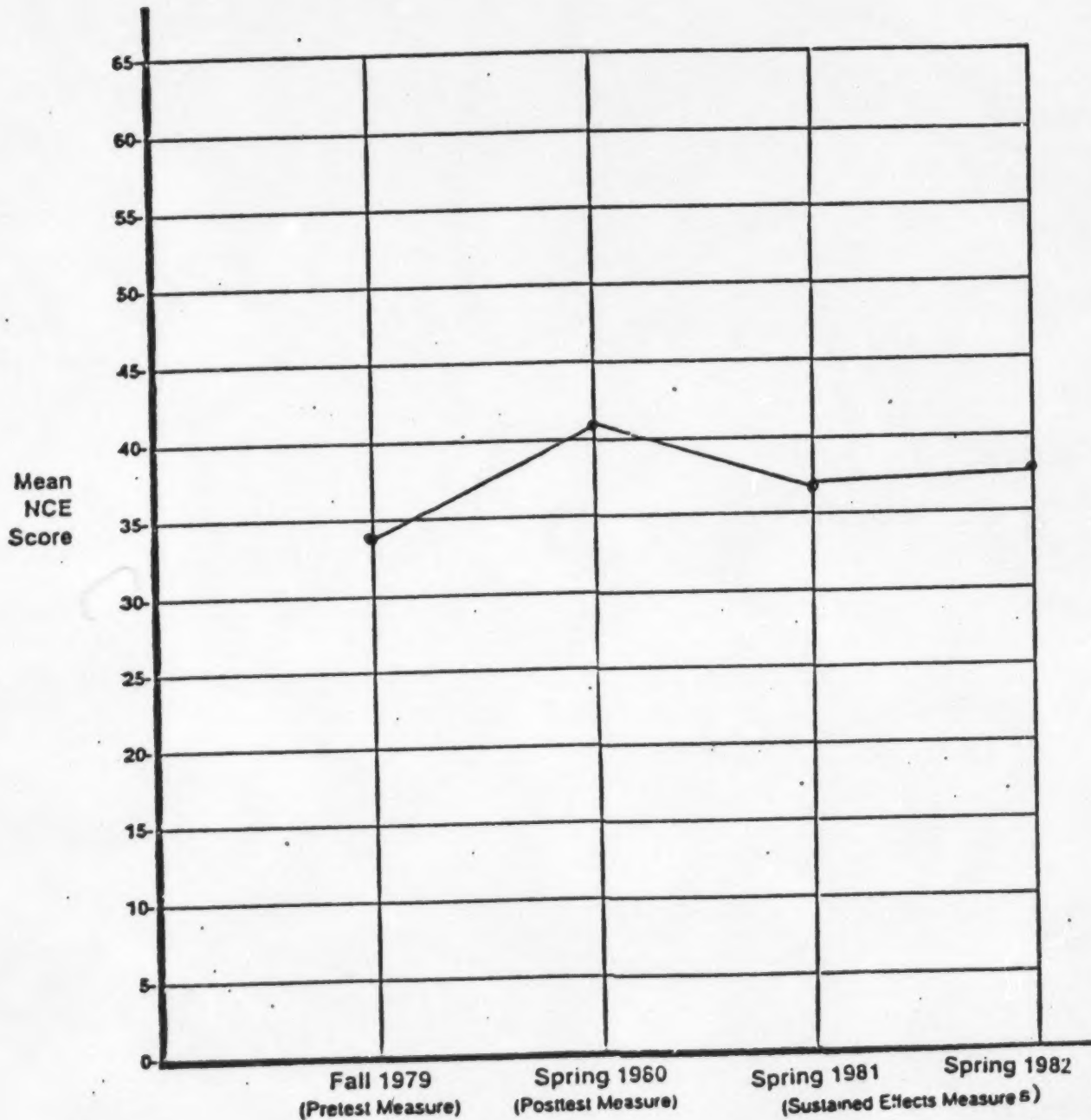
A - All students ————
 B - Maintained students x-----
 C - Phased students o- - - -



Sustained Effects Plotting Graph D

BUILDING _____ GRADE LEVEL 7-9 NO. OF STUDENTS 6

A - All students ———●———
 B - Maintained students ———x———
 C - Phased students ———o———



Sustained Effects Plotting Graph E

BUILDING _____ GRADE LEVEL 8-10 NO. OF STUDENTS 7